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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
09/370.326	08/09/99	SHOJI	K NEC-N99-1019

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EXAMINER

PAREKH, N

ART UNIT

PAPER NUMBER

2811

DATE MAILED:

10/23/00

**Please find below and/or attached an Office communication concerning this application or proceeding.**

**Commissioner of Patents and Trademarks**

# Office Action Summary

Application No.

09/370,326

Applicant(s)

Shoji

Examiner

Nitin Parekh

Group Art Unit

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☒ Responsive to communication(s) filed on Aug 7, 2000

☒ This action is **FINAL**.

☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 35 C.D. 11; 453 O.G. 213.

A shortened statutory period for response to this action is set to expire 3 month(s), or thirty days, whichever is longer, from the mailing date of this communication. Failure to respond within the period for response will cause the application to become abandoned. (35 U.S.C. § 133). Extensions of time may be obtained under the provisions of 37 CFR 1.136(a).

## Disposition of Claim

☒ Claim(s) 1 and 3-11 is/are pending in the application.

Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.

☐ Claim(s) \_\_\_\_\_ is/are allowed.

☒ Claim(s) 1 and 3-11 is/are rejected.

☐ Claim(s) \_\_\_\_\_ is/are objected to.

☐ Claims \_\_\_\_\_ are subject to restriction or election requirement.

## Application Papers

☒ See the attached Notice of Draftsperson's Patent Drawing Review, PTO-948.

☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.

☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.

☐ The specification is objected to by the Examiner.

☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119

☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d).

☒ All ☐ Some\* ☐ None of the CERTIFIED copies of the priority documents have been

☒ received.

☐ received in Application No. (Series Code/Serial Number) \_\_\_\_\_

☐ received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

\*Certified copies not received: \_\_\_\_\_

☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

## Attachment(s)

☒ Notice of References Cited, PTO-892

☒ Information Disclosure Statement(s), PTO-1449, Paper No(s). 3 and 7

☐ Interview Summary, PTO-413

☒ Notice of Draftsperson's Patent Drawing Review, PTO-948

☐ Notice of Informal Patent Application, PTO-152

— SEE OFFICE ACTION ON THE FOLLOWING PAGES —

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## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1 and 3-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Shoji in view of the admitted prior art and Okumura (US Pat. 4807021).

Regarding claims 1, 3 and 4, Shoji discloses an array of electrodes fabricated on an insulating substrate having a conductive pattern on a major surface comprising:

- plural electrodes fixed to the conductive pattern, and
- an insulating resin layer with a meniscus configuration around the plural electrodes, directly covering a remaining portion of the major surface except surfaces of the plural electrodes to anchor the plural electrodes to the insulating substrate

(Fig. 5; Fig. 1-6C; Col. 2-9).

Shoji fails to specify using a conductive paste selected from the group consisting of silver paste, gold paste, copper paste and solder paste to fix the electrodes to the conductive pattern. It is conventional in the chip interconnection and packaging art to use a variety of bonding methods

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using solder paste printing/reflow, powder of a conductive material, conductive paste, etc. for the interconnection of conductive patterns. Okumura teaches using a conductive paste made from the group of metals consisting of silver, gold, platinum or solder paste to form a conductive interconnections between electrodes particles/balls such as gold, aluminum, solder, etc. (Col. 7, line 2 and 33) and electrode pads (Fig. 11-18; Col. 5, line 59-Col. 7, line 10). Therefore, it would have been obvious to the person of ordinary skill in the art at the time invention was made to use a conductive paste selected from the group consisting of silver paste, gold paste, copper paste and solder paste to fix the electrodes to the conductive pattern to improve the rework process capability using Okumura's teaching in Shoji's array as cited in claims 1, 3 and 4.

Regarding claims 5 and 6, Shoji discloses using a synthetic resin with meniscus configuration selected from the group consisting of polyimide resin, epoxy resin, phenol resin, acrylic resin, etc, (Col. 2-9), but fails to specify the resin as a thermosetting type. However, Shoji further discloses the prior art specifying the using the conventional resins which are thermosetting type (Fig. 1-3; Col. 2-9). Mori teaches using the conventional thermosetting resins selected from the group consisting of polyimide resin, epoxy resin, phenol resin, silicon resin, etc. for insulating the electrodes (Col. 3). Therefore, it would have been obvious to the person of ordinary skill in the art at the time invention was made to use thermosetting resin with meniscus configuration selected from the group consisting of polyimide resin, epoxy resin, phenol resin, acrylic resin and

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silicon resin to provide reinforcement and rigidity to the base in Shoji's array in view of Okumura as cited in claims 5 and 6.

Regarding claims 7-9, Shoji discloses the solder bump/ball electrodes formed on the conductive land of the conductive pattern fixed to the electrodes of a semiconductor chip (Fig. 1-6C; Col. 3; Col. 2-9).

Regarding claims 10 and 11, Shoji discloses forming the plural electrodes made of a heat fusible conductive material comprising bits of heat-fusible conductive material comprising solder and fixing them to the conductive pattern (Col.3; Fig. 1-6C; Col. 2-9).

### ***Response to Arguments***

2. Applicant's arguments filed on 08-07-00 have been fully considered but they are not persuasive.

A. Applicant contends that Okumura does not teach using a conductive paste to fix solder balls to a conductive pattern. However, Okumura teaches using a conductive paste made from the group of metals consisting of silver, gold, platinum or solder paste to form a conductive interconnections between electrodes particles/balls such as gold, aluminum, solder, etc. (Col. 7, line 2 and 33) and electrode pads (Fig. 11-18; Col. 5, line 59-Col. 7, line 10).

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For the above reasons, it is believed that the rejections should be sustained.

3. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

Papers related to this application may be submitted directly to Art Unit 2811 by facsimile transmission. Papers should be faxed to Art Unit via Technology Center 2800 fax center located in Crystal Plaza 4, room 4C23. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (15 November 1989).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nitin Parekh whose telephone number is (703) 305-3410. The examiner can be normally reached on Monday-Friday from 08:30 am-5:00 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas, can be reached on (703) 308-2772. The fax number for the organization where this application or proceeding is assigned is (703) 308-7722 or 7724.

Nitin Parekh

10-22-2000

*Tom Thomas*  
Tom Thomas  
Supervisor, Examiner  
October 22, 2000